

***Orthemis sibylla*, a junior synonym of *O. ambirufa* (Odonata: Libellulidae)**

Rosser W. Garrison & Natalia von Ellenrieder

Research Associate, Natural History Museum of Los Angeles County,

Exposition Boulevard 900, CA 90007, USA.

<rwgarrison@earthlink.net> <odo_nata@hotmail.com>

Key words: Odonata, dragonfly, *Orthemis ambirufa*, *O. sibylla*, synonymy.

ABSTRACT

Orthemis sibylla is shown to be a junior synonym of *O. ambirufa*, based on a comparison of the holotype male of *O. ambirufa* with voucher specimens in the UMMZ identified as *O. sibylla* by Ris and specimens of this species from French Guiana and Venezuela in the RWG collection. Diagnostic characters of the male holotype of *O. ambirufa* are illustrated, and compared with those of *O. levis*.

INTRODUCTION

The New World genus *Orthemis* comprises 17 species. The names assigned to specimens of the *Orthemis ferruginea* (Fabricius, 1775) complex have been particularly difficult to associate with species (De Marmels 1988; Donnelly 1995; Paulson 1998, 2001), mainly due to a lack of comparison with type material. Here, we examine the status of two names, *O. ambirufa* Calvert, 1909 and *O. sibylla* Ris, 1919, and conclude that both represent the same species.

The original description of *O. ambirufa*, based on a single male from Chapada, Brazil (Calvert 1909), was largely comparative with *O. levis* Calvert, 1906, and lacked illustrations. Calvert stated that the "Genitalia of the second abd. seg. [were] apparently not different [from *O. levis*]". In his monograph of the Libellulinae, Ris (1910) did not examine this species, and only stated before transcribing Calvert's original description [here translated]: "I have not included it in the diagnostic key because I haven't found any specimens that completely agree with this short description...".

Under *O. aequilibris* Calvert, 1909, Ris (1910) included one male from Surinam and three females from Amazonas, Venezuela, and Bolivia, respectively. Later (1919), Ris described *O. sibylla* from the same male from Surinam which he had earlier (1910) mistakenly placed under *O. aequilibris*. Thus, his illustrations of the hamules (Ris 1910: fig. 162) are of the holotype male of *O. sibylla*. In his description of *O. sibylla* (here translated), Ris (1919) stated:

"The description was checked again against the specimen and was found to be exact. I haven't seen any other specimen of *Orthemis* that could be associated with this male. It corresponds very closely in general with the description of *O. ambirufa* Calvert (p. 290); but it is clearly stated there that the genitalia of *ambirufa*

look the same as those of *levis*. Since in our specimen the hamulus is apparently smaller and slightly differently shaped than that of *levis*, I think it is safer to give that one a new name instead of including it, maybe wrongly again, under the unknown *ambirufa*.”

Rácenis (1954) collected a pair of *Orthemis* in Guárico State, Venezuela, and concluded – based on a comparison with Ris’ (1919) description – that this pair represented *O. sibylla*. He also commented that the three females included by Ris (1910) as *O. aequilibris* more likely represent the female sex of *O. sibylla*. He did not mention *O. ambirufa*, and its identity has remained a mystery since its description.

SPECIMENS STUDIED

Through the kindness of Robert Davidson, we were able to borrow the holotype of *Orthemis ambirufa* from the Carnegie Museum of Natural History (CMNH) and compare it with the following specimens:

O. sibylla, 7 ♂ — French Guiana: 3 ♂, small canal 17 km S of Tonate, 18 ii 1988. — Venezuela: 1 ♂, Bolivar State, Canaima at Rio Carrao, 12-14 viii 1990; 2 ♂, Amazonas State, 2 km E San Carlos de Río Negro, 5-11 iii 1984, leg. O.S. Flint, Jr. and J. Louton, det. J. De Marmels; all in coll. R.W. Garrison. — Brazil: 1 ♂, “Santarem-Amaz., XII-1920” in the University of Michigan, Museum of Zoology Collection (UMMZ), det. F. Ris.

O. levis, 10 ♂ — Mexico: 2 ♂, Jalisco State, Arroyo Chamela, 26-27 vii 1994, leg. E. González, R. Mendoza, and A. Godinez. — Honduras: 1 ♂, Punta Gorda, vi 1933, leg. J.J. White. — Costa Rica: 3 ♂, Guanacaste Prov., Hacienda Taboga, 06 vii 1966, 03 v 1967. — Venezuela: 1 ♂, Carabobo State, San Esteban, 03 ii 1920, and 3 ♂, Zulia State, El Guayabo, 20 iv 1920, leg. W.H. Ditzler, J.H. and E.B. Williamson; all in coll. R.W. Garrison.

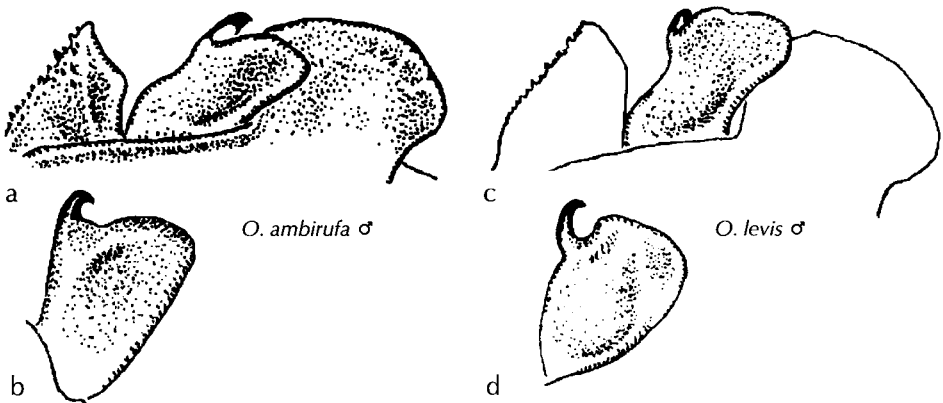


Figure 1: Structural comparison of male *Orthemis ambirufa* (left) with *O. levis* (right) — (a, c) genital fossa, lateral view; (b, d) right posterior hamule, frontal (anterior) view. *O. ambirufa* is represented by the holotype, *O. levis* by a male from Costa Rica, Guanacaste Province, Hda. Taboga, leg. 6 July 1966, collection D.R. Paulson.

ARGUMENTS FOR SYNONYMIZATION

We illustrate the genital fossa with the right hamule (Figs 1a, 1b), caudal appendages (Fig. 2a), and thoracic pattern (Fig. 2b) of the holotype of *Orthemis ambirufa*. These structures agree well with those of specimens that we identified as *O. sibylla* based on its original description and comparison with voucher specimens at the UMMZ determined by Ris. The thoracic design is consistent with that of *O. sibylla* illustrated by Rácenis (1954). The lateral view of the hamule of the holotype of *O. sibylla* illustrated by Ris (1910: fig. 162; as *O. aequilibris*) shows the hamule's outer branch more strongly pointed than what we illustrate here for the holotype of *O. ambirufa*, but in both instances they are roundly pointed. Although the hamule is similar to that of *O. levis* (Figs 1c, 1d) as Calvert stated (1909), the outer branch of the hamule in that species is evenly rounded, not roundly pointed as in *O. ambirufa*. This condition is best seen when the hamule is viewed in frontal view (Figs 1b, 1d).

Based on the examination of the holotype of *O. ambirufa*, and on comparison with voucher material identified as *O. sibylla* by Ris and with the original descriptions of both species, we recommend that *O. sibylla* be considered a junior subjective synonym of *O. ambirufa* as follows:

Orthemis ambirufa Calvert, 1909: 246 [type: Chapada, Brazil, in CMNH].

Orthemis aequilibris Calvert, 1909. Ris (1910): 287, fig. 162 (in part, misidentified).

Orthemis sibylla Ris, 1919: 1104 [type: Surinam, in coll. Selys, Brussels]. — Rácenis (1954). — New synonymy.

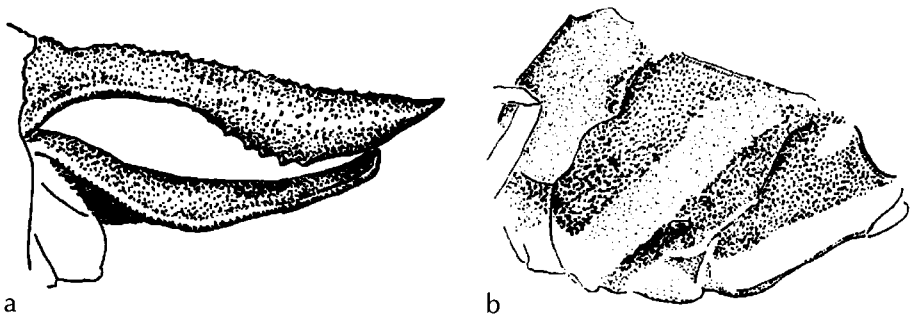


Figure 2: Holotype male of *Orthemis ambirufa* — (a) caudal appendages, lateral view; (b) pterothorax, lateral view.

ACKNOWLEDGEMENTS

We thank Robert Davidson (CMNH, Pittsburgh, PA, USA) for the loan of the holotype of *Orthemis ambirufa*, Mark O'Brien (UMMZ, Ann Arbor, MI, USA) for his kind assistance, and Dennis Paulson (Seattle, WA, USA), Sid Dunkle (Plano, TX, USA), Jürg De Marmels (Maracay, Venezuela) and Wolfgang Schneider (Darmstadt, Germany) for their critical reading of the manuscript.

REFERENCES

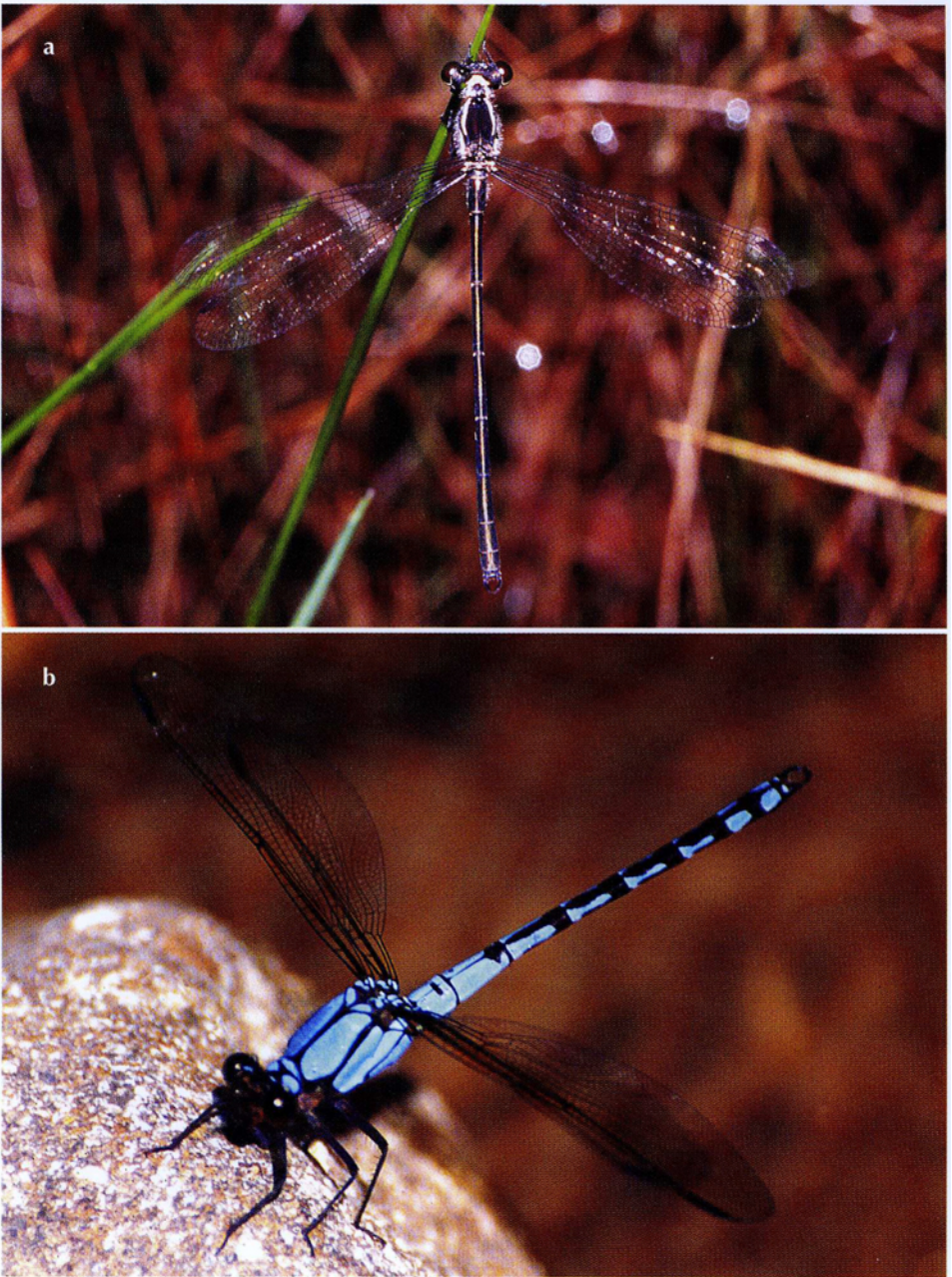
- Calvert, P.P., 1909. Contributions to a knowledge of the Odonata of the Neotropical region, exclusive of Mexico and Central America. *Annals of the Carnegie Museum* 6: 73-280.
- De Marmels, J., 1988. Odonata del Estado Táchira. *Revista Científica Unet* 2: 91-111.
- Donnelly, T.W., 1995. *Orthemis ferruginea* – an adventure in Caribbean biogeography. *Argia* 7 (4): 9-12.
- Paulson, D.R., 1998. The distribution and relative abundance of the sibling species *Orthemis ferruginea* (Fabricius, 1775) and *O. discolor* (Burmeister, 1839) in North and Middle America (Anisoptera: Libellulidae). *International Journal of Odonatology* 1: 89-93.
- Paulson, D.R., 2001. *Orthemis schmidtii* is a widespread species. *Argia* 13 (3): 24-25.
- Rácenis, J., 1954. Descubrimiento de *Orthemis sibylla* Ris (Odonata: Libellulidae) en Venezuela. *Novedades Científicas, Contribuciones Ocasionales del Museo de Historia Natural La Salle, Caracas (Serie Zoológica)* 13: 1-4.
- Ris, F., 1910. Libellulinen monographisch bearbeitet. Vol. I. Libellulinen 3. *Collections Zoologiques du Baron Edm. de Selys Longchamps. Catalogue Systématique et Descriptif* 11: 245-384, pl. III.
- Ris, F., 1919. Libellulinen monographisch bearbeitet. Vol. III. Libellulinen 9. *Collections Zoologiques du Baron Edm. de Selys Longchamps. Catalogue Systématique et Descriptif* 16 (Deuxième Partie): 1043-1278.



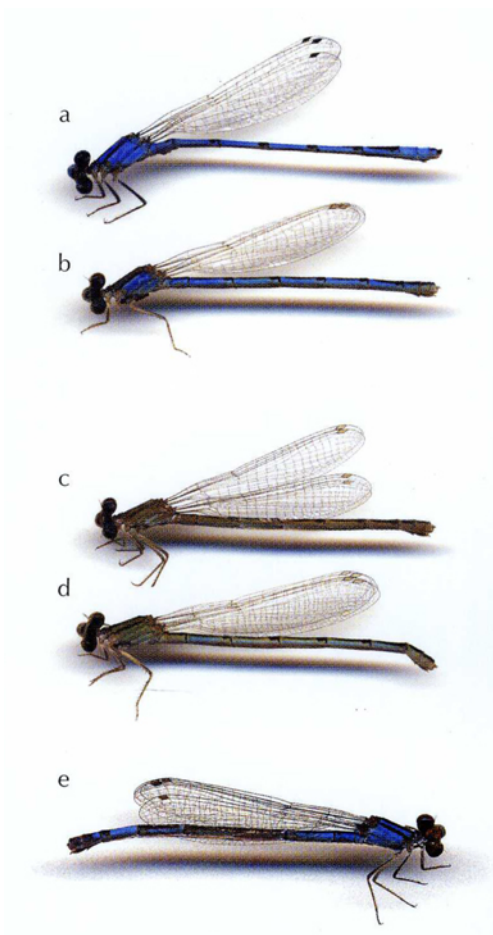
Colour plate I: *Somatochlora borisi* — (a) premature female from the Diavolorema River near Mikron Dherion, NE Greece, 6 May 2004; (b) mature female from the same locality, 1 June 2003. The abdominal pattern with extensive yellow is typical of this species. Photos by Jean-Pierre Boudot.



Colour plate II: *Idomacromia jillianae* sp. nov. — (a) holotype female; (b) type locality at Ruhija in Uganda, Kabale District, Bwindi Impenetrable National Park (alt. 2,100 m) – view of Mubwindi Swamp and the Virunga Volcanoes, with the collecting site in the forest to the right of the swamp. Scan and photo by Klaas-Douwe Dijkstra.



Colour plate III: Two typical zygopteran openingwing perchers — (a) *Griseargiolestes griseus* (Megapodagrionidae), Govett's Leap, Blue Mountains National Park, New South Wales, Australia, 11 December 1998; (b) *Diphlebia nymphoides* (Diphlebiidae), Megalong Creek at Old Ford Reserve, New South Wales, Australia, 11 December 1998. Photos by Dennis Paulson (a) and Netta Smith (b). See also cover photo.



Colour plate IV: Color variation of *Enallagma civile* and examples of heterospecific pairing — (a) male; (b) andromorphic female; (c) heteromorphic female; (d) intermediate type female; (e) the other study species in comparison: andromorph female of *E. aspersum*, a monomorphic species; (f) intrageneric mistake: male of *E. carunculatum* in tandem with female of *E. basidens*; (g) another intrageneric mistake: male of *Platycnemis pennipes* accompanying an ovipositing female of *P. acutipennis*; (h) intergeneric mistake: male of *Ischnura elegans* in tandem with female of *Erythromma lindenii*; (i) mistake between different families: male of *Coenagrion ornatum* in tandem with female of *Platycnemis pennipes*. Scans and photos by Tom Schultz (a-e), Dustin Huntington (f) Mathias Lohr (g) and Bernd Kunz (h, i).